UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/681,108	01/10/2001	Christopher R. Dance	D/A0967	7643

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EXAMINER
LAROSE, COLIN M

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _07 January 2005_.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _2-5,7-9,12-15,17-19 and 21-26_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _2-4,12-14 and 21_ is/are rejected.

7) ☒ Claim(s) _5,7-9,15,17-19 and 22-26_ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a) ☐ All b) ☐ Some * c) ☐ None of:

   1. ☐ Certified copies of the priority documents have been received.

   2. ☐ Certified copies of the priority documents have been received in Application No. _____.

   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on 7 January 2005 has been entered.

Response to Amendments and Arguments

2.   In view of Applicant's arguments and amendments submitted 7 January 2005, all

previous §§ 101, 102, 103, and 112 rejections, if applicable, have been withdrawn.

Claim Objections

3.   The following sections of 37 CFR §1.75(a) and (d)(1) are the basis of the following

objection:

> (a)   The specification must conclude with a claim particularly pointing out
> and distinctly claiming the subject matter which the applicant regards as his
> invention or discovery.
>
> (d)(1)   The claim or claims must conform to the invention as set forth in
> the remainder of the specification and the terms and phrases used in the
> claims must find clear support or antecedent basis in the description so
> that the meaning of the terms in the claims may be ascertainable by
> reference to the description.

4.   Claims 4, 14, 21 and 22 are objected to under 37 CFR §1.75(a) and (d)(1) as failing to

particularly point out and distinctly claim the subject matter that the applicant regards as the

invention.

Claim 21 recites, "a window may be smaller ... and may overlap." These limitations are

indefinite because it is unclear whether they are requirements, and one skilled in the art would

not be fairly apprised of the metes and bounds of the claim. The claim should recite what the

invention "is" as opposed to what it "may be." The "smaller" and "overlap" features should

therefore be positively recited. Correction is required.

[Claim 22 depends from 21 and is objected to for the same reasons.]

5.   Claims 4 and 14 include two equations $G(y,x)$ that are identical and based on $R(y,x)$. It

appears that one of the equations should be written in terms of $B(y,x)$. Correction is required.

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed
in the United States before the invention by the applicant for patent or (2) a patent granted on an application for
patent by another filed in the United States before the invention by the applicant for patent, except that an
international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this
subsection of an application filed in the United States only if the international application designated the United
States and was published under Article 21(2) of such treaty in the English language.

7.   Claims 2-4, 12-14, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by

U.S. Patent 6,721,003 by Tsuruoka et al. ("Tsuruoka").

Regarding claims 2 and 12, Tsuruoka discloses an apparatus (figure 1) comprising means

to perform the method (figure 7) comprising:

recording an image of spatially consistent sampled values output from a color filter array,

each of a plurality of pixels in the image having a location at which a sampled value of only one

of a plurality of color channels is recorded (figure 1, input section 101: records an image in a

Bayer-type pattern – see figure 3);

computing coefficients of a linear transformation using color channels of sampled values

of the plurality of pixels in the image without interpolating values of other color channels of the

plurality of pixels not recorded in the image (figure 1, color correlation regression section 113:

coefficients of a linear transformation [equation (9) in column 10] are computed, and the

computing of coefficients is carried out without interpolating values of other color channels – i.e.

a missing color component S_i is generated on the basis of the computed coefficients and the

known color component S_j and requires no interpolation of any sort – see also figure 6); and

using the linear transformation and the sampled value at the location of a selected one of

the plurality of pixels in the image to estimate a color channel not recorded at the location of the

selected pixel in the image (figure 1, missing pixel reconstruction section 114: missing color

components are reconstructed using the linear transformation (as well as the sampled value)).

Regarding claims 3 and 13, Tsuruoka discloses computing the coefficients by computing

statistics that depend on the sampled value but not the position of the samples of at least two

color channels within a window of the image (i.e. the coefficients in equation (9) – standard

deviation and mean – do not depend on the positioning of values; also, the statistics are

computed within window(s) of the image – column 9, lines 53-67: statistics are calculated from

"uniform regions," such as shown in figure 4).

Regarding claims 4 and 14, Tsuruoka discloses the claimed linear transformations (see

equation (9)).

Regarding claim 21, Tsuruoka discloses a method (figure 7) for reconstructing color filter

array images, comprising:

(a) acquiring an image using a color filter array that records spatially consistent samples

of a plurality of color channels with only one sample of different ones of the plurality of color

channels being records at each pixel in the image (image with Bayer-type pattern is inputted at

input section 101, figure 1);

(b) assigning a selected pixel in the image to a window that may be smaller than the

image and that may overlap other windows assigned to other pixels in the image (selected pixel

S1 is assigned to a region at S6 – see also figure 4, which shows small, overlapping regions);

(c) using the color channels of recorded samples to estimate coefficients for a linear

transformation for the window assigned to the selected pixel in the image without interpolating

values of color channels not recorded in the image (S7: standard deviation and average determine

the coefficients of equation (9));

(d) estimating a value for one or more of the plurality of color channels not recorded at

the selected pixel location with (i) the recorded sample at the selected pixel location and (ii) the

linear transformation for the window assigned to the selected pixel (S9); and

(e) repeating (b), (c), and (d) for other selected pixels in the image (S11: process repeats for other pixels, if any).

Allowable Subject Matter

8.   Claims 5, 7-9, 17-19, and 23-26 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

9.   Claim 22 would be allowable if rewritten to overcome the above objection to claim 21 and to include all of the limitations of claim 21.

Regarding claims 5, 15, and 22, Tsuruoka is silent to the computing of the coefficients comprises fitting the linear transformation to "at least one pair of sums of color channels that are summed along lines through a window of the image," as claimed and as detailed in § 4.2 of the Specification.

Claims 7-9, 17-19, and 23-26 depend directly or indirectly from claims 5 and 15 and would be allowable for the same reasons.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (571) 272-7423. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached on (571) 272-7414. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the TC 2600 Customer Service Office whose telephone number is (571)

272-2600.

CML

Group Art Unit 2623

9 April 2005

VIKKRAM BALI
PRIMARY EXAMINER